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PLANTING OF DECORATIVE GRAIN CROPS IN CONDITIONS OF PRODUCTION BY THE EXAMPLE OF PE «*LIRIS*»

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There were analyzed the stages of planting of decorative grain crops by vegetative way in the conditions of open soil and generative way in the conditions of protected soil at the private enterprise Liris for the following application of them in garden and park art at the territory of Ukraine. There were also defined the profitability and given the recommendations concerning the planting of decorative grain crops.

Decorative grain crops, open soil, generative propagation, vegetative propagation, planting material, grasslands.

Grain crops in the past took up to 30% of dry land territory of our planet. Nowadays their spaces decreased up to 20% so as considerable part of grasslands are replaced by farming lands [4]. Grassland is the type of grassland vegetation with the domination or with considerable part of plant stand of grass (according to A. P.Iljinski). Among grasslands, there are prairies of former USSR, Asia, prairies of America, grass spaces of North Africa, Australia and the New Zealand [1].

Considerable part of grasslands is primary i.e. it developed naturally. Among them, there are prairies, Alpine meadows, savannas. In the latter case, the grass cover with the domination of grass grains is added by rare shock of trees and bushes. Besides that, there are secondary grasslands –meadows that developed at the place of forests cut by men. Such grasslands are preserved till they are used by a human: the human makes hay and tends cattle. In another time, the meadows are overgrown by forest [2].

The significant role of grain crops in green cover of the Earth can be explained by the fact that they are well adjusted to isolation of vegetative mass and grow fast

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after that (i.e. they have high recovery ability). Because of that, the formation of Eurasian steppes and American prairies took place with the participations of ungulate animals, phytophagous organisms without which these populations cannot exist. Nowadays these wild phytophagous organisms were replaced by livestock which can do harm plant formation if they prevail in big quantity and cause its deterioration [2].

Grain crops differ by long fire persistence that is usual phenomenon for hot steppes and savannas. Eventually, grain crops have very interesting and beneficial morphology. They have narrow leaves that are situated at an acute angle towards to sunlight that increases photosynthesizing surface. Crop grains can more actively in comparison with another grasses assimilate the elements of mineral nutrition. This fact enables them to dominate in very different conditions – from river shoal to dry deserts [1].

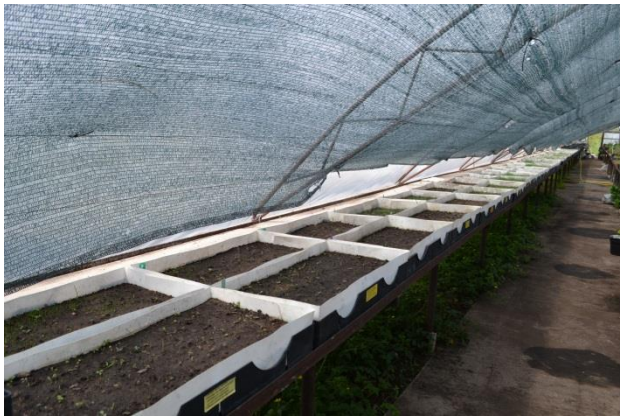
The crop grains of natural deserts and savannas have high intensity of photosynthesis. On the average biological productivity of such populations turns out to be twice higher in comparison with seeding in the same conditions and this is implemented without expenses for cultivation of land and fertilizers [3]. Namely because of the resistance to environmental conditions of growth and low expenses of cultivation and care of crop grains gained popularity in enterprises that are engaged in growth of planting material for landscaping of the areas of different functional designation.

The aim of research is to analyze the growth stages of crop grains in a production environment for the usage in landscape gardening art in Ukraine.

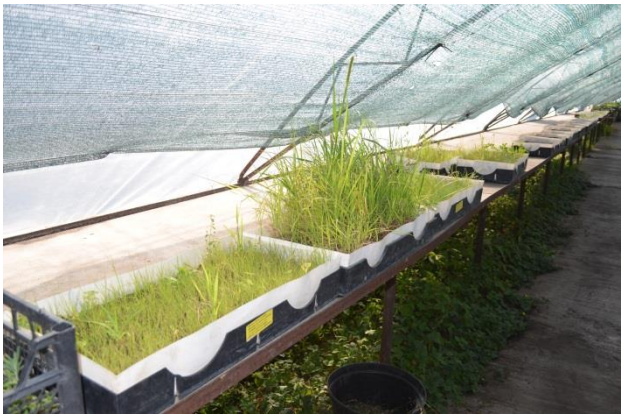
The subject of research is a private enterprise "*Liris*" located in Chmyrivka village of Bila Tserka region in Kyiv oblast.

The object of research is the representatives of crop grains family (Poaceae), namely their decorative species.

Results. Private enterprise "*Liris*", located in the village Chmyrivka of Bila Tserka region in Kyiv oblast grows perennial flowers for open soil that are used in the design of alpine garden, border beds, flowerbeds and mix borders, flowerbeds and rockeries. On the territory of this enterprise nursery, it is grown more than 600



Pic.1. Shelves with newly sowed decorative crop grains in the greenhouse PE «Liris».



Pic.2. Seedlings of decorative crop grains in the greenhouse PE «Liris» as of 25th day after seeding

varieties of flower names and few shrubs. For many years, the company grows in nursery conditions decorative crop grains for further growing of them in the open soil and their farm marketing. During this time, the owners found in practice the optimal sequence of stages of decorative crop grains growing, which helps quickly to gain a high-quality and low-cost planting material.

The seeds of crop grains in comparison with the majority of flower crops have very small size that complicates the process of planting by sowing in the open soil [6]. That is why PE "*Liris*" grows decorative crop grains by seeding in the boxes in the greenhouse. Soil for sowing of seeds is prepared beforehand and it consists of turf, sand and grey forest soil in the ratio 2:1:1. The investigations carried out by us the previous year showed that on the turf soils crop grains develop less intensively, however, at the period of blossom they have similar look as those ones that grow at the local grey forest soil.

Preliminary preparation of seeds is not implemented. Seeds taken from mother lot is preserved in the packages on the shelves up to the moment of its seedling in the boxes. The seed sowing is carried out in scattering manner, it can be explained by its small size and low springing up of decorative crop grains. In the beginning of March crop grains seeds are sowed in prewet soil. The depth of sowing depends on the seed size and it comprises its double size. After the sowing, the seeds are powdered with soil and slightly evened.

A B

Pic.3. Transplanted plantlets of hairlike sedge (Carex capillaris): A- cassettes; B – containers for 9 L

The seedlings appear at the 18^{th} – 22^{th} days. The complicity of growing is in the fact that crop grains are monocotyledonous plants with intercalary growth. The seedlings of cultivated crop grains do not differ from the seedlings of gramineous weeds (for instance, yellow foxtail or couch grass) that make it impossible to dig through weeds in boxes for better development of seedlings. That is why soil for growing needs maximum cleaning from plant remains of weeds.

When first 3-4 genuine leaves show up, transplanting from boxes into containers is carried out. Different size of containers is used for different species. Thus, for example, Festuca glauca and Stipa are transplanted in cassettes, and majority of Pennisetums - in containers for 6 and 9 L. During the transplanting root is washed in water and immerged in the solution of kornevin or heteroauxin. The experience of crop grains planting on the enterprise shows that the more root channel is cut back during the transplanting, the better the plant is growing in the process of vegetation. At the 3-4 day after transplanting plants are fertilized by agrecol for crop grains. The calculation of the given fertilizers is 10-20 g per a plant. These containers are placed on the exposition area outside of a greenhouse in the open ground. On a sunny place that is well ventilated plants develop better, they do not need more fertilizer. These plants need to be watered every two days, but they can do without irrigation longer period.

In the open soil at the nursery of PE "*Liris*" decorative crop grains are grown by vegetative way. Crop grains have the ability to rapidly grow which simplifies breeding of these plants [5]. In early May, maternal plants are excavated and they are

separated from viable vegetative organs (or their parts) capable of regeneration. This method vegetative propagation is called division of the bush. Separated parts of mother plants are planted at a distance of 15-20 cm in the row. Thus, for example, from one parent bush of fescue bluish with diameter of 45-50 cm one can receive up to 30 individual plants. Thickness of separation can be different; the thicker separated bush is, the faster it has habitus.

Pic.4. Lot of decorative crop grains of open soil at the nursery of PE "*Liris*"

Fertilizers for plants that grow and winter in the open soil at the company are brought in the spring at the rate of 25-30 g per each plant. "Agricole for decorative crop grains" are used; agricole is a long-acting granular fertilizer. Granulars provide a gradual discharge of nutrients, which is controlled by natural environmental factors such as humidity and temperature, so nutrition takes place gradually over a full growing season. Beside single entry of the fertilizer no feeding is performed.

Decorative crop grains generally winter in the open soil. Early in the spring the cleaning of dead shoots is carried out and shoots of most crop grains are cut [5]. Irrigation of the lot is carried out naturally as far as rainfall, and the plants grow well

throughout the growing season. This indicates at indiscriminateness of crop grains to environmental conditions of growth and ability to adapt to them.

Expenses for growing of decorative crop grains in production conditions are quite low. In generative propagation, seeds are taken from the mother lots and collected from exhibition lots after the blossom period, so the expanses for seed material are not available. Separated shrubs during the vegetative year make sufficiently formed habitus and can be used as mother plants for the next growing year. So there are also no costs for mother plants at vegetative propagation. The average cost for bush grown for one growing season of a decorative crop grains varies within 40-50 grivnas. Even taking into account the costs for greenhouse watering, fertilizing, salaries and other costs for planting and maintenance, it is not difficult to assess the profitability of growing decorative crop grains in a production environment.

Conclusions

The crop grains are unpretentious in care, they require minimal labor costs and money means for their cultivation and care. This type of planting material has proven its profitability in production conditions and quickly gained popularity among landscape designers and clients of the company. However, the complexity of growing lies in the similarity of seedlings with monocotyledonous weeds, which also belongs to the crop grains family (*Poaceae*); so the most rational way of breeding of decorative crop grains for private purposes and small areas are vegetative propagation.

At a private enterprise "*Liris*" decorative crop grains are grown both by generative and vegetative method. Both methods of cultivation should be rationally used in a production environment. In generative method in production conditions low germination is compensated by large areas that while transplanting provides sufficient amount of plant material. Concerning vegetative method, during the period of growing of decorative crop grains in PE "*Liris*, survival rate of plants separated from the parent species ranged within 98-100%.

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